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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/769,977	02/03/2004	Manfred Stute	095309.53149US	8985

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EXAMINER	
ONEILL, KARIE AMBER	
ART UNIT	**PAPER NUMBER**
1745	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/769,977	STUTE, MANFRED	
	Examiner	Art Unit	
	Karie O'Neill	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 May 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-14 and 16-25* is/are rejected.

7)☒ Claim(s) *2 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The Applicant's amendment filed on May 22, 2007, was received. Claims 1-2, 6, 9-10, 14-15, 19, and 22-23 were amended. Therefore, Claims 1-25 are pending in this office action.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on January 12, 2007.

Claim Rejections - 35 USC § 102

3. The rejection of Claims 1, 3, 6, 8-11, 14, 16, 19 and 21-23 under 35 U.S.C. 102(e) as being anticipated by Formanski et al. (US 2004/0151958 A1) is maintained.

With regard to Claims 1, 11 and 14, Formanski et al. disclose in Figures 7 and 10, a mobile fuel cell system powering a vehicle (paragraph 0006), comprising: an expander (102), and a compressor (44) that is at least partially driven by the expander. A burner (122) produces hot gases of combustion that at least occasionally flow through the expander through line (104), the expander receiving heated and pressurized cathode exhaust gas (paragraph 0031), wherein the hot gases, after flowing through the expander (102), emit at least part of the thermal residual energy remaining in them to at least one of the fuel flows supplied for combustion. This is done through the heat exchanger (156) that is placed in the line (108) at the output of the expander (102) (See Figure 10) and flows back to the line (50), which connects to another heat exchanger

(72) that flows into the burner (122) that contains fuel from line (124) (see Figure 7). The heat exchanger is disposed downstream of the expander and upstream of the burner, which would still allow for the heat exchanger to be disposed between the expander and the burner.

With regard to Claims 3 and 16, Formanski et al. disclose in paragraph 0031, wherein the compressor (44) and expander (102) are configured as one component on the same shaft (106), and wherein the expander uses the temperature of the cathode gas to rotate an element therein that rotates a shaft (106) and is coupled to a motor that influences the gases flow.

With regard to Claims 6, 8, 19 and 21, Formanski et al. disclose in paragraph 0033, wherein combustion takes place in a burner (122) and wherein the combustion is configured as combustion of a fuel supplied from the anode to burn residual hydrogen in the anode exhaust gas and further heats the cathode exhaust gas before it is applied to the expander and the gases are indirectly supplied back to the fuel cell through the compressor (44).

With regard to Claims 9, 10, 22, and 23, Formanski et al. disclose wherein at least during occasional phases of operation, the hot gases, after flowing through the expander (102), emit at least part of the thermal residual energy remaining in them to at least one of the fuel flows supplied for combustion, this being done through the heat exchanger (156) that is placed in the line (108) at the output of the expander (102) (See Figure 10) and flowing back to the line (50) which provides the fuel which is combusted in the burner (122) (see Figure 7), emit additional remaining thermal energy through an

additional recuperative heat exchanger (152) coupled to a coolant loop (154) through which flows a cooling fluid such as a glycol/water mixture (paragraph 0037).

Claim Rejections - 35 USC § 103

4. The rejection of Claims 4, 12, 17 and 24 under 35 U.S.C. 103(a) as being unpatentable over Formanski et al. (US 2004/0151958 A1), as applied to Claims 1, 3, 6, 8-11, 14, 16, 19 and 21-23, and in further view of Hoffman et al. (US 2003/0182944 A1), is maintained. The rejection is repeated below for convenience.

Formanski et al. disclose the device in paragraph 3 above, but do not disclose wherein the expander is configured as a turbine having a variable turbine guide screen.

Hoffman et al. disclose a gas-turbine generation system including a pressure-reducer that is an expander, the expander having variable-pitch blades which control the amount of medium flow in and/or our of the expander (Abstract). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use a turbine having variable-pitch blades with the expander of Formanski et al., because Hoffman et al. teach the turbine having variable-pitch blades to allow efficient variation of turbine outlet pressure (Abstract).

5. The rejection of Claims 5, 13, 18 and 25 under 35 U.S.C. 103(a) as being unpatentable over Formanski et al. (US 2004/0151958 A1), as applied to Claims 1, 3, 6, 8-11, 14, 16, 19 and 21-23, and in further view of Huber (US 5,722,241), is maintained. The rejection is repeated below for convenience.

Formanski et al. disclose the device in paragraph 3 above, but do not disclose wherein the compressor is configured with a variable diffuser.

Huber discloses an axial compressor (200) comprising a first (152), second (154) and third (156) set of rotor blades which compress the ambient air entering the compressor and a diffuser (286) which can vary the degree of diffusion to minimize the sum of total pressure loss (column 2 lines 50-59 and column 4 lines 1-3). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use a variable diffuser with the compressor of Formanski et al., because Huber teaches the compressor configuration representing a high Mach number and low pressure loss approach (column 3 lines 15-16).

6. The rejection of Claims 7 and 20 under 35 U.S.C. 103(a) as being unpatentable over Formanski et al. (US 2004/0151958 A1), as applied to Claims 1, 3, 6, 8-11, 14, 16, 19 and 21-23, and in further view of Graage (US 2003/0035988 A1), is maintained. The rejection is repeated below for convenience.

Formanski et al. disclose the device in paragraph 3 above, but do not disclose wherein the burner is configured as a catalytic burner.

Graage discloses in paragraph 0022, the burner (16) combusting the exhaust gases through a catalytic combustion process. Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use a catalytic combustor as the burner in the device of Formanski et al., because Graage discloses using a

catalytic burner to convert the chemical energy of residual oxygen, hydrogen and non-reacted residues of hydrocarbon derivatives into thermal energy (paragraph 0022).

Allowable Subject Matter

7. Claims 2 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: the closest prior art, Formanski et al. (US 2004/0151958 A1), does not teach or fairly suggest wherein the heat exchanger receives exhaust gases after the expander, as well as air that flows through the heat exchanger for combustion.

Response to Arguments

9. Applicant's arguments filed May 22, 2007, have been fully considered but they are not persuasive.

10. *Applicant's principal arguments are:*

(a) Formanski et al. does not suggest the presence of a heat exchanger between the combustor and the expander.

In response to Applicant's arguments, please consider the following comments:

(a) In Figure 10, Formanski et al. show an expander (108), combustor (122) and heat exchangers (156, 152, 72). In the flow of the system, the heat exchangers are all disposed downstream of the expander and upstream of

the combustor, placing the heat exchangers between the expander and the combustor.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571) 272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Karie O'Neill
Examiner
Art Unit 1745

KAO

DAFI WEI YUAN
PRIMARY EXAMINER